MONTANA
POLICY REVIEW

Technical Issues

By Don Brostrom,

The IMTC is made up of technical representatives from each of the nine consortia that make up the IMPD. Collectively they represent some of the best radio minds in the state of Montana and bring a wealth of local knowledge of wireless communications throughout the state.

Background

The Interoperability Montana Project Directors (IMPD) has two committees reporting to it: The Interoperability Montana Governance Committee (IMGC) to define the short and long-term governance of the IM system, and due to the highly technical nature of interoperable radio communications, the Interoperability Montana Technical Committee (IMTC). The IMTC is tasked with overseeing the design and technical definition of the IM system.

The IMTC serves an important role in evaluating technology, determining technical specifications for equipment and sites, assessing communications sites, identifying and licensing frequencies, ensuring compliance with P25 standards, and addressing encryption and bandwidth issues. The IMTC has formulated technical criteria that have been used to prepare a prioritized list of infrastructure projects, which the IMPD has adopted.

The IMTC is made up of technical representatives from each of the nine consortia that make up the IMPD. Collectively they represent some of the best radio minds in the state of Montana and bring a wealth of local knowledge of wireless communications throughout the state. This expert group meets weekly via telephone and conducts monthly face-to-face meetings. Subcommittees of the IMTC include:

- Frequency Planning, Acquisition and Licensing
- Microwave and Radio Network Design
- Radio Unit Encryption
- Dispatch Connectivity

Ultimately, the IM Project will provide advanced channel management for the shared use of frequencies, seamless roaming, and enhanced responder safety through embedded signaling, while at the same time enhancing interoperable communication with existing legacy VHF

radios. This approach will allow public safety responders in Montana to exchange voice and data communications on demand and in real time during emergencies and disasters.

Technology

The IM system is being designed and implemented in accordance with the SIEC technical standard adopted in June of 2004 (http://siec.mt.gov/docs/SIEC_I_O_Def_tech_req.doc). This technical standard guides the definition of the IM system to become:

- A standards-based shared system of systems,
- A wide area system,
- Utilizing P25 trunked and P25 digital / analog conventional technologies,
- Providing interoperability among P25 narrowband digital trunked and existing conventional users,
- Seamlessly integrating with infrastructure equipment deployed in CDP 1 - Southwest Interoperability Project and CDP2 - Northern Tier Interoperability Project,
- Operating in the VHF frequency range,
- Connected by high-capacity digital microwave backbone for voice and data interconnect traffic,
- Providing advanced channel management for the shared use of frequencies,
- Providing seamless roaming throughout the respective trunked areas (footprint)
- Providing enhanced responder safety through embedded signaling,
- Providing enhanced interoperable communication with existing legacy VHF radios,
- Integrating with the current mutual aid channels.

Trunking – Trunked radios have a well-established foundation in public safety communications and is the technology in use or under development by many of the states and provinces neighboring Montana and throughout our region. Trunking brings two primary strengths to public safety communications: seamless roaming within the trunked footprint, and dynamic channel management among radio users. Both of these are made possible by connecting trunked radio sites to the master control site, which oversees and coordinates both radio and dispatch communications.

Interoperable Repeater – Each trunked radio site within the IM system has one interoperable repeater that is tied into the system. This repeater operates in the VHF spectrum and in both analog and digital modes. The interoperable repeater serves mutual aid responders that do not have equipment capable of operating on the trunked system. It's configured such that it can be incorporated into an Incident Communications Plan as either a tactical repeater or as a gateway between conventional analog or digital radios and the trunked system.

Digital Microwave – A key component in both trunked radio communication and mobile data is connectivity through a high-speed, high-capacity digital microwave backbone. The IM network is designed to carry voice and data throughout the state utilizing current technologies while remaining positioned for future IP-based communications.

Coverage – Before responders can be interoperable, they must first be operable. A large part of operability is the selection of radio sites that provide adequate coverage for mobile, portable, and data communications. The IMTC works with local agencies and leverages local knowledge in selection of radio sites that provide superior coverage over a wide geographic area and is on or can be incorporated into the microwave backbone for trunked traffic.

Frequencies – Because of the characteristics

of the VHF frequency band over large, mountainous areas and the mix of local, state and federal responders who must communicate throughout Montana on a daily basis, the IM project is being developed utilizing the VHF spectrum.

Standards – The IMTC has developed and maintains a document of Best Practices which provides standards and guidance as the project moves forward. Examples include grounding standards, shelter and tower specifications, power and backup power requirements, and future growth.

Infrastructure – Sites that are incorporated into the IM system are brought to the strictest standard of communications. The sites are grounded according to the R-56 standard. The shelters are OSHA compliant and physically secure with multiple alarms in place. The power is backed up with an appropriately sized generator designed to operate in the extreme conditions inherent in the mountaintop sites throughout Montana. The towers are designed to accommodate high winds and icing conditions. The overall design of each site allows for foreseeable future growth.

Encryption – Certain public safety responders require the ability to conduct secure communications, either for responder safety or as required by HIPAA. The IMTC has developed standards to address encryption at the local, regional and statewide level, for both interagency use and mutual aid.

The Future

The only constant in technology is that it's forever changing. Public safety communication continues to evolve at the local, state and federal levels. On the horizon are IP-based radios and software controlled radios; 700 Mhz and broadband mobile data; regional and national mutual aid plans. Throughout it all though, the mission of the IMTC will remain the same: improve communications for the responder on the ground to improve their safety and their ability to serve the public.

Don Brostrom is the Hill County Undersheriff and
Chair of the Interoperability Montana Technical Committee